unforeseen consequences. Yet, as observed in the Royal Society's recent report,[6] well established practices already minimise such dangers in the case of conventional cultivars. For example, oilseed rape for human consumption contains low levels of erucic acid, which is toxic to humans, whereas industrial oilseed rape contains high levels. So the two varieties are grown sufficiently far apart to prevent cross pollination.

Transfer of antibiotic resistance genes from genetically modified plants (where they are used as markers during the genetic manipulation process) to pathogenic bacteria is another theoretical danger.[6] However, there is no evidence that this has happened. The risks are considered to be at most remote, especially in comparison to plasmid transfer from other bacteria. The Advisory Committee on Releases to the Environment has recommended that plants should not be produced with genes conferring resistance to antibiotics used in human and veterinary medicine. And drug resistance markers are now being supplanted by alternatives.

One factor has heavily influenced the public debate on genetically modified foods in both the UK and continental Europe. This is the coincidence between their emergence and the outbreaks of bovine spongiform encephalopathy and *Escherichia coli* 0157 infection in the UK. Though apparently linked through their effects on public trust in the technology of food production, epidemics of food borne infection have no rational relation to the consideration of genetically modified plants.

As announced at the European Biotechnology Forum, held in Brussels in December, the French seed supplier Groupe Limagrain will be segregating its genetically modified and non-modified plants by the middle of this year. Such a scheme will, however, be fully effective only if other companies along the food chain follow suit. The European Commission is now considering a threshold (possibly 3%) for the permissible level of genetically modified ingredients in foods from farm to plate.

Prices will, of course, reflect the extra expense of segregation and the higher costs of growing conventional crops lacking the advantages (such as pest resistance) of genetically modified varieties. Some customers will be content to pay, as with organic produce today. Others will prefer the fruits of genetic manipulation, such as the tomato purée and cheese made with recombinant chymosin—which are already on sale. The fact that these explicitly labelled products have been selling well in the UK, where the debate is particularly robust, is the most remarkable paradox of all.

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1 House of Lords Select Committee on the European Communities. *EC Regulation of Genetic Modification in Agriculture*. London: Stationery Office, 1999.
2 Jones L. Genetically modified foods. *BMJ* 1999;318:581-4.
3 Mann CC. Crop scientists seek a new revolution. *Science* 1999; 283:310-4.
4 Carson R. *Silent spring*, London: Hamish Hamilton, 1963.
5 Bauer MW, Durant J, Gaskell G, Liakopoulos M, Bridgman E. United Kingdom. In Durant J, Bauer MW, Gaskell G, eds. *Biotechnology in the public sphere*, London: Science Museum, 1998.
6 Royal Society. *Genetically modified plants for food use*. London: Royal Society, 1998.

Infection and preterm delivery

There is not yet enough evidence that antibiotics help

Preterm delivery is defined as delivery before the 37th completed week of pregnancy, and in 1996 in Scotland 84% of neonatal deaths of normally formed infants were associated with preterm delivery.[1] The aetiology of preterm delivery is poorly understood, though recent evidence suggests that infection may be implicated in a substantial proportion of cases.[2] The part that infection plays in the development of preterm labour or preterm, pre-labour rupture of membranes leading to preterm delivery has been the focus of much research in recent years.

One element of this work has been the finding of a strong association between the presence of bacterial vaginosis and preterm delivery. Bacterial vaginosis is a common infection of the female genital tract, caused by heavy concentrations of a mixed group of organisms, including *Gardnerella vaginalis*, *Mycoplasma hominis*, and anaerobes including curved rods and *Mobiluncus* species. Many of these organisms are present in small numbers in the vagina normally. Symptomatic infection is characterised by a grey vaginal discharge with a characteristic fishy odour. It is not associated with vaginal mucosal inflammation and rarely causes vulval itch.

Bacterial vaginosis is often asymptomatic and is found in up to 20% of women during pregnancy depending on how often the population is screened.[3] A substantial body of evidence now exists that associates bacterial vaginosis infection in pregnancy with a poor perinatal outcome, in particular an increased risk of preterm delivery.[4] This strong association has led many researchers and clinicians to believe that bacterial vaginosis may be the cause of preterm delivery in these women. Therefore a series of treatment trials have been undertaken using antibiotics with known efficacy against bacterial vaginosis, in particular metronidazole and clindamycin.[5] The results of these trials in preventing preterm delivery, however, have not been encouraging.[6 7]

There is some suggestion that treating women with a previous preterm delivery who have asymptomatic bacterial vaginosis in pregnancy may reduce the risk of subsequent preterm delivery. However, this has been observed in only two trials, one where it was found in a subgroup analysis of a small number of women[6] and one which had substantial methodological problems.[8] There is as yet no convincing evidence that screening all women antenatally for bacterial vaginosis and

BMJ 1999;318:548–9

treating those affected will have any impact on the incidence of preterm delivery. The results of further continuing trials are awaited.

Other investigators have concentrated on the observed association between spontaneous preterm delivery and subclinical or asymptomatic chorioamnionitis. In these women it is postulated that bacteria, from whatever source, set up an inflammatory reaction in the fetal membranes leading to the cascade of events culminating in preterm delivery. This hypothesis is currently being tested in a large randomised controlled trial, the ORACLE trial, which aims to determine whether antibiotics can improve neonatal outcome in women presenting with preterm labour or preterm pre-labour ruptured membranes.[2] This trial aims to recruit 10 000 women and should be completed in the year 2000.

The ORACLE trial is likely to produce results directly relevant to clinical practice and policy. The disadvantage of many trials in this area is that their main outcome measure to assess the effectiveness of antibiotics is gestation at delivery. While this may superficially appear to be appropriate, increasing gestational age may not improve neonatal or maternal wellbeing. Firstly, antibiotics may benefit mother and baby without affecting the duration of pregnancy. Secondly, lengthening gestation may not confer any benefit to the fetus/neonate and may even result in harm, as suggested by overviews of trials of tocolysis in pregnancy.[9]

Although advocates of the link between infection and preterm delivery may claim that antibiotics treat the cause of the condition rather than try to suppress the symptoms and are therefore fundamentally different from tocolysis, the problems of relying on gestation at delivery as an outcome measure remain.[10] This has been highlighted by recent evidence about the well documented link between chorioamnionitis and cerebral palsy. Work in rabbits has shown that experimentally induced chorioamnionitis treated with antibiotics and delayed delivery results in white matter lesions in the fetal brain.[11] Whether this damage is a consequence of the chorioamnionitis alone or the combination of chorioamnionitis and pregnancy prolongation is not yet known. But if infection in humans does lead to preterm labour or preterm pre-labour rupture of the membranes as a consequence of chorioamnionitis, either from the vagina or elsewhere, then the best management option may be delivery. Attempts to maintain the fetus in a hostile environment may result in more harm than benefit.

Therefore any trial that evaluates the use of a treatment to prevent preterm delivery must show that the intervention benefits the baby and not just the obstetrician. Subclinical chorioamnionitis or bacterial vaginosis may well turn out to account for a substantial proportion of preterm deliveries. This has not yet been demonstrated, however, and until it has the use of antibiotics to prevent preterm delivery must continue to be seen as an experimental treatment which may result in more harm than good.

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1 Information and Statistics Division. *Scottish stillbirth and infant death report 1996*. Edinburgh: NHS in Scotland, 1997.
2 Taylor D, Kenyon S, Tarnow-Mordi W. Infection and preterm labour. *Br J Obstet Gynaecol* 1997;104:1338-40.
3 Lamont RF, Fisk NM. The role of infection in the pathogenesis of preterm labour. In: Studd JWW, ed. *Progress in obstetrics and gynaecology*. Vol 10. London: Churchill Livingstone, 1993:135-58.
4 Hillier SL, Nugent RP, Eschenbach DA, Krohn MA, Gibbs RS, Martin DH, et al. Association between bacterial vaginosis and preterm delivery of a low-birth-weight infant. *N Engl J Med* 1995;333:1737-42.
5 Joesoef MR, Schmid GP. Bacterial vaginosis: review of treatment options and potential indications for therapy. *Clin Inf Dis* 1995;20(suppl):S72-9.
6 McDonald HM, O'Loughlin JA, Vigneswaran R, Jolley PT, Harvey JA, Bof A, et al. Impact of metronidazole therapy on preterm birth in women with bacterial vaginosis flora (Gardnerella vaginalis): a randomised, placebo controlled trial. *Br J Obstet Gynaecol* 1997;104:1391-7.
7 Hauth JC, Goldenberg RL, Andrews WW, DuBard MB, Copper RL. Reduced incidence of preterm delivery with metronidazole and erythromycin in women with bacterial vaginosis. *N Engl J Med* 1995;333:1732-6.
8 Morales WJ, Schorr S, Albritton J. Effect of metronidazole in patients with preterm birth in preceding pregnancy and bacterial vaginosis: a placebo controlled, double-blind study. *Am J Obstet Gynecol* 1994;171:345-9.
9 Keirse MJNC. Betamimetic tocolytics in preterm labour. In: Enkin MW, Keirse MJNC, Renfrew MJ, Neilson JP, eds. Pregnancy and childbirth module. *Cochrane database of systematic reviews*. Oxford: Update Software, 1994: issue 1.
10 Lamont RF. New approaches in the management of preterm labour of infective aetiology. *Br J Obstet Gynaecol* 1998;105:134-7.
11 Yoon BH, Kim CJ, Romero R, Jun JK, Park KH, Choi ST, et al. Experimentally induced intrauterine infection causes fetal brain white matter lesions in rabbits. *Am J Obstet Gynecol* 1997;177:797-802.

Public health psychiatry or crime prevention?

Government's proposals emphasise doctors' role as public protectors

In the wake of the recommendations of the Fallon inquiry into the personality disorder unit at Ashworth Hospital [1 2] the government has now announced its own solution to the problems presented by people with antisocial[3] or dissocial[4] personality disorder.[5] After a joint Home Office and Department of Health review which ran in parallel with the Fallon inquiry it has proposed for consultation new services and law. Although not prescriptive about the detail of its solution, both the government's philosophy and its resolve are clear. In pursuing, above all, public protection, it intends services which essentially hybridise punishment and health care, with law that allows preventive detention of even the unconvicted.

The uncertain treatability of antisocial personality disorder,[6] consequent professional therapeutic ambivalence,[7] and inherent uncertainty about the moral status of the condition (whether individuals "suffering" from it are mad or bad)[8] combine sensibly to imply a hybrid service solution which is far more radical than that which emerged from the last government's attempt at a similar review.[9] Reflecting its close look at various European service models, the present government seems to intend a "third way," involving establishing new specialist institutions which would be

BMJ 1999;318:549–51